The Next Big Thing: Grid Computing
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Catalyst

Analyst collaboration

Question

What is the next big thing for IT infrastructure?

Answer

Grid computing, as with other emerging technologies, is many things to many vendors — and the definition varies based on the goals of each. The concept of global grids is generating increasing interest among industry vendors due to the potential for the architecture to support Web Services. At its core, grid computing is "plumbing" that enables distributed resource management and services on demand, and promises to be the evolution of the Internet into a computing platform. Grid computing can provide cost savings as an alternative to building out a company's own hardware, storage and networking infrastructure.

What makes grid computing "the next big thing" is that it enables:

- The ability to support the sharing of resources e.g., computing power, storage and applications with quality of service, over the Internet

- The migration of applications in a more dynamic and flexible manner

- Quality of service through virtual integration

- Resource sharing across multiple organizational boundaries with a common set of infrastructure requirements

The grid computing marketplace is segmented into three distinct categories: cluster grids, campus grids and global grids. The similarity between cluster grids and campus grids is that they are implemented behind a firewall; the difference is that a cluster grid has one owner and a campus grid has multiple users. In contrast, a global grid, still an up-and-coming technology, is different from cluster and campus grids because it is designed to be accessible by multiple users over the Internet. It is a global grid's ability to support a variety of heterogeneous systems with variable quality of services over the Internet that is drawing increasing interest. This is in large part due to the fact that cluster grids and campus grids have been in use for years. The challenge is in expanding grid computing beyond cluster and campus grids used today by the financial services, manufacturing, bioinformatics and scientific research segments to the concept of a global grid. This is challenging because today security, workload management and systems management are all tightly integrated into a native operating system's APIs and semantics. To create a global grid, a common set of APIs and open protocols are required to enable dynamic cross-organizational resource sharing. Several industry efforts and individual companies, including the Globus Project, DRMMA and **Avaki**, are working on defining these interfaces (see IdeaByte, The Globus Project: A Framework for Grid Computing, Stacey Quandt). IBM has proposed an Open Grid Services Architecture, which is a number of distributed protocols centered around security, authentication, identification and collaboration.

The real issue is how fast the grid computing market will grow. Giga believes that 2002 and even 2003 will be dominated by companies using cluster and campus grids and it will take until 2005 for the use of global grids to accelerate. The global grid is a key focus of **IBM**, but **Sun**, **Compaq**, **Microsoft**, **Fujitsu-Siemens** and **NEC** also share this vision. **Hewlett-Packard** (HP) uses the terminology Planetary and Utility computing. The most significant problems lie in enabling security and auditability. Although IBM is working with **Platform Computing**, the Globus Project and others to build the global grid segment, at the same time, it is focused on addressing this through the organic growth of its eLiza Project, a self-managing, self-healing software framework (see IdeaByte, IBM Sets Direction for Self-Managing, Self-Healing Computing Systems with Project eLiza, David Mastrobattista). In contrast, Sun Microsystems' initial entry to the grid computing market was through the acquisition of **Gridware**, and, subsequently, it changed the name of the Gridware software product to Sun Grid Engine.

With many emerging technologies, what's old is new, and grid computing is no exception. Distributed computing initially made its mark through a number of nonprofit programs, like SETI@home, where almost 3 million people volunteered idle cycles of their PCs for use in digesting data on possible alien radio signals. **Intel** led the support for a similar project designed for AIDS research. **Boeing** has demonstrated that a company can save money and boost efficiency by using this approach for projects like complex simulations (see IdeaByte, Market Overview: Peer-to-Peer Technology Complex but Some Winning Niches Emerging, Stan Schatt). While distributed computing and grid computing are related to one another conceptually, grid computing does not specifically target utilizing unused PC cycles.

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There are still several obstacles to widespread adoption of global grid computing by enterprises, including security, the possible impact on local area network (LAN) and wide area network (WAN) traffic patterns, lack of centralized control and lack of standards. This last point will be the primary concern of IT managers. However, the lack of standards in grid computing is not uncommon for an emerging technology, but it does create uncertainties for IT managers. Questions to ask are, how are grid computing solution from Sun, IBM, Compaq, HP and others different? How will clustering and dump facilities be represented in a common way? What platform should companies use for developing applications? What APIs will become standard? What programming language should be used? Will certain types of authorization and authentication become standards?

Organizations should take a close look at the following vendors already in this space: IBM, Hewlett-Packard, Sun Microsystems, Compaq, Platform Computing, Avaki, the Globus Project, **Entropia**, **Cisco**, **Hughes Network Systems**, Intel, **Juniper Networks**, **Motorola**, **Qwest**, **SGI**, **Sterling Software**, **Velocita Corp**., **Veridian/PBS**, **Viagenie Inc**. and **Zytec Telecom Ltd**.